



# Vehicle and Axle Load Scales

Preparation for Scale Examination

Chapter 2



# Commercial and Law Enforcement

- ◆ Commercial
  - buying or selling
  - service
    - transportation (freight, household moving).
    - storage, processing.
    - vehicle weighing service.
- ◆ Law enforcement
  - **vehicle weights (total and axle loads)**
  - **statistical purposes**



# Purpose of Inspection

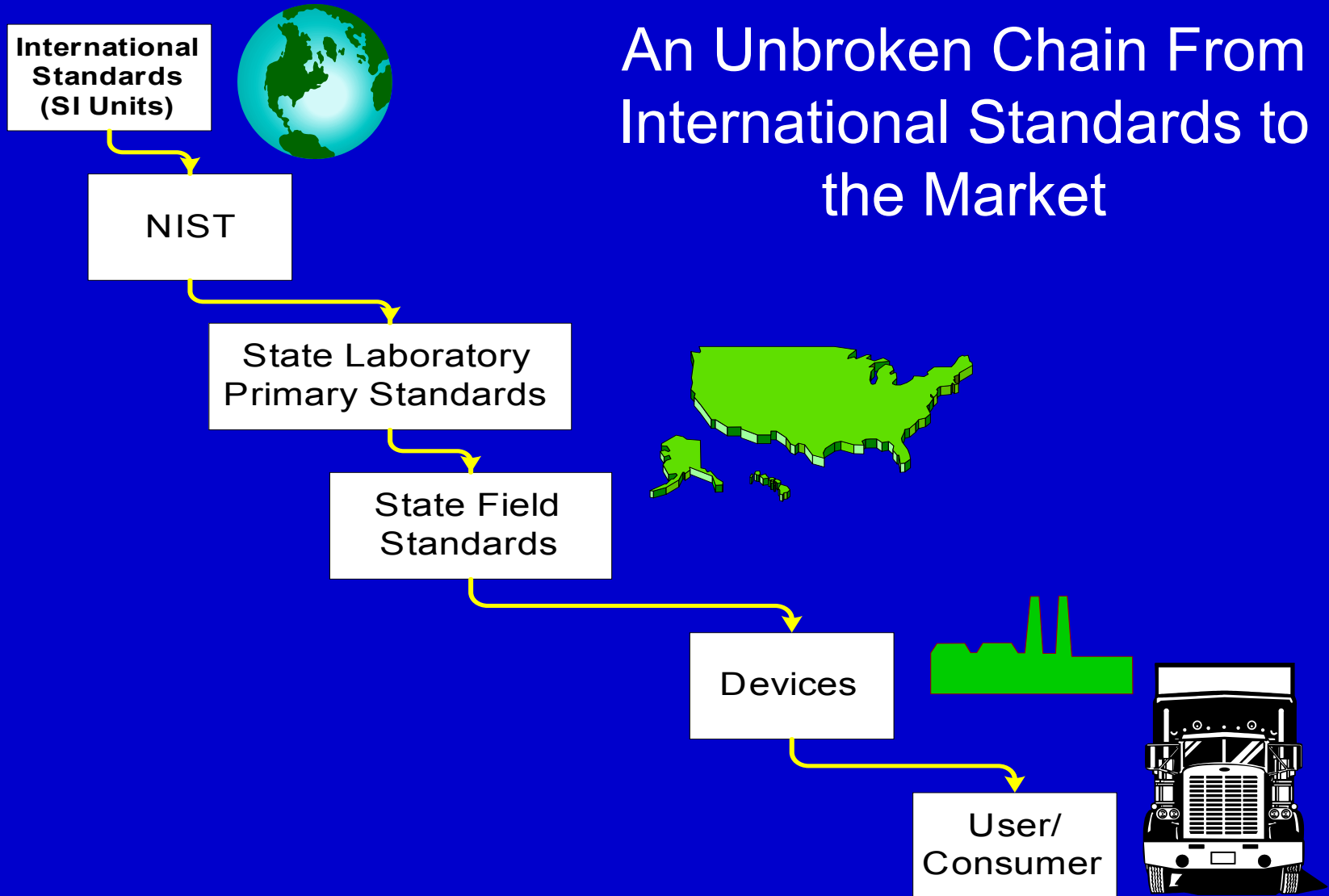
- ◆ Accurate: a piece of equipment is "accurate" when its performance or value—that is, its indications, its deliveries, its recorded representations, or its capacity or actual value, etc., as determined by tests made with suitable standards conforms to the standard within the applicable tolerances and other performance requirements. Equipment that fails so to conform is "inaccurate."



# Purpose of Inspection

- ◆ Correct: A piece of equipment is "correct" when, in addition to being accurate, it meets all applicable specification requirements. Equipment that fails to meet any of the requirements for correct equipment is "incorrect."

# Measurement Traceability





# Basis of WMI Inspection

- ◆ **NIST Handbook 44 “Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices.”**
- ◆ **NIST Handbook 112 “Examination Procedures Outlines for Commercial Weighing and Measuring Devices”**
- ◆ **NIST Handbook 130 “Uniform Laws and Regulations...”**



# Revisions to Handbooks

- ◆ A state can modify handbook requirements through policy or regulation.
- ◆ The National Conference of Weights and Measures is a forum where the handbooks are revised on an annual basis.
- ◆ Proposals typically go through Regional Associations.
- ◆ All officials deserve the opportunity to participate.



# Authority

- ◆ State laws and regulations give you the authority to conduct inspections.
- ◆ Most states adopt the handbooks either by reference or through their administrative procedures acts.
- ◆ All states set their own policies regarding frequency of inspection and enforcement actions.



# Authority

- ◆ Authorized to enter any commercial premises during normal business hours, except that in the event such premises are not open to the public, he/she shall first present his/her credentials and obtain consent before making entry thereto, unless a search warrant has previously been obtained.



# Safety

You must comply with the safety regulations in effect at the location where you are working.

- Cranes
- Power lines
- Weights
- 1000 lb  
cannonballs



- **Environments**
- **Alarms in chemical and other plants.**
- **Safety equipment**
- **Traffic**
- **Climbing on and off of trucks.**
- **Driving a truck loaded to near maximum capacity**  
**100 %**





**Unloading and moving carts.**

**Working with partners.**

**Breaking through scale decks.**



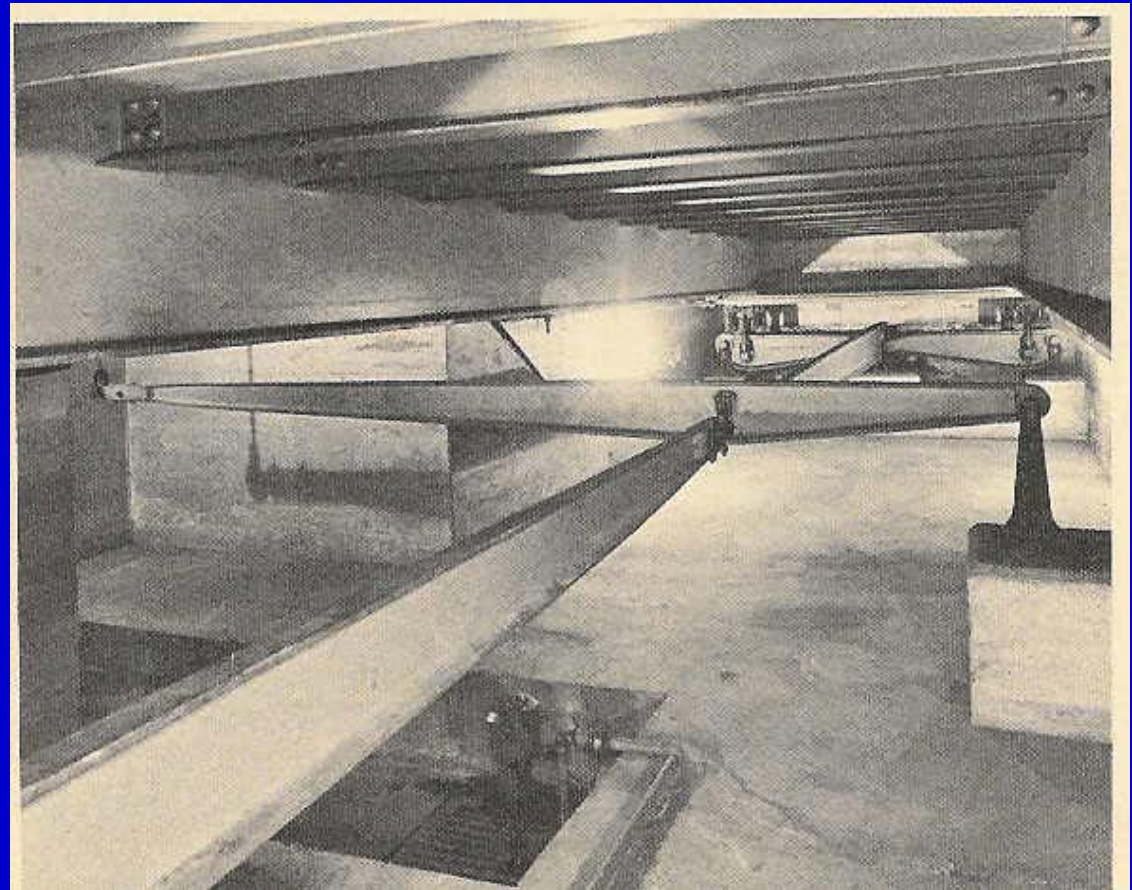
**Traction, Braking, Flipping**

# Pit Inspections

**Confined  
Spaces**

**Fumes and  
other Hazards**

**Especially  
dangerous  
when under  
repair.**



# Inspections

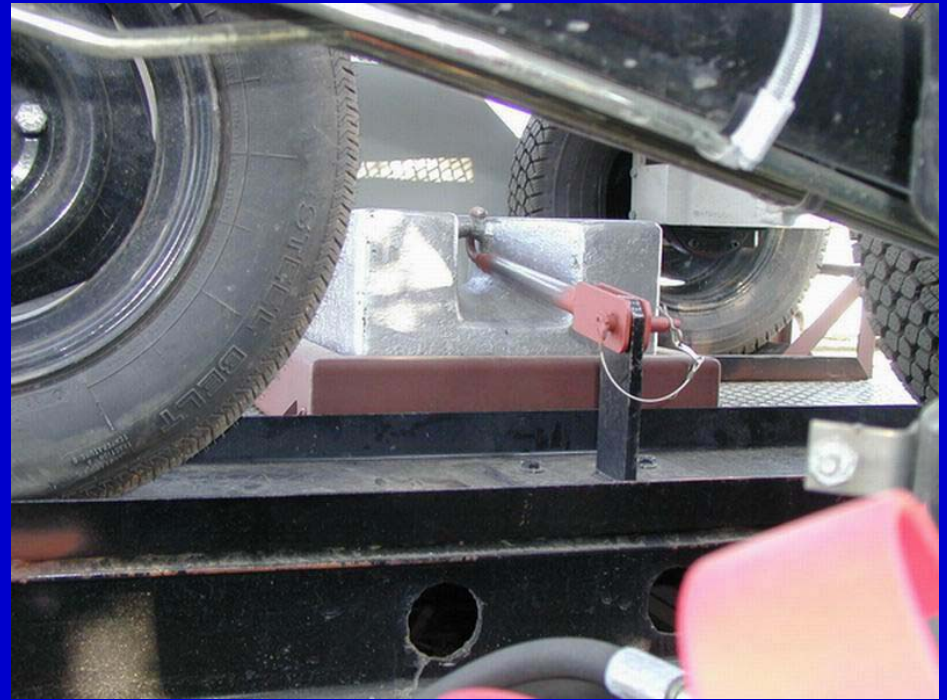
**Fall and trip hazards.**


**Driving off scale.**





# Secure Everything






# Policies, Examination Procedure Outline

---

- ◆ Inspection
- ◆ Pretest Determinations
- ◆ Test
- ◆ Evaluation of Results



# Inspection and Test Equipment

- ◆ Official Identification.
- ◆ Inspection records and reports.
- ◆ Approval and security seals.
- ◆ Law, Handbooks and Examination Procedures.
- ◆ Safety equipment.
- ◆ Common sense.



## N.2. Verification (Testing) Standards

- ◆ Comply with the requirements and tolerances of NIST Handbook 105-1 for Class F or §3.2 Fundamental Considerations.

# Other Standards







## N.3. Minimum Test Weight and Test Loads<sup>1</sup>

- ◆ Table 4

- ◆  $\leq 40,000$  - test with weights up to 12.5% of scale capacity (or 1000 lb) and test up to 50% of scale capacity with test load.
- ◆  $> 40,000$  – test with weights up to 12.5% of scale capacity (or 10,000 lb), test up to 25% of scale capacity with a test load.
  - where practical: test to dial capacity, 1000 d, or used capacity and to capacity during initial inspection.

**See next slide**



## Footnotes 1 and 2

- ◆ 1 “Apply Safe Loads”
- ◆ 2 Test load: means the sum of ... test weights and any other applied load used in the conduct of a test using substitution test methods. Not more than three substitutions shall be used ... after which the tolerances for strain load tests shall be applied to each set of test loads.



## Footnote 3

- ◆ The scale should be tested to at least 12.5% of scale capacity using known test weights and then to at least 25% of scale capacity using either a substitution or strain load test that utilizes known test weights of at least 12.5% of scale capacity.
- ◆ Whenever practical: a strain load test should be conducted to the used capacity of the scale. When a strain load test is conducted, the tolerance apply only to the test weights or substitution test load.











# Documentation

- ◆ Identity and location
- ◆ Responsible party
- ◆ Type, model and accessories.
- ◆ Dimensions & capacities
- ◆ Type of use.
- ◆ GPS
- ◆ Performance record
- ◆ Accuracy
- ◆ Section tests with positions identified.
- ◆ Installation, maintenance, and user requirements.
- ◆ Historical record.



# Summary

- ◆ Purpose of the inspection
- ◆ Authority
- ◆ Safety
- ◆ Inspection and Test Equipment
- ◆ Documentation